

APAXXX

Series of panel computers for rolling stock

Service manual

Release 1.00



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History of revisions

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Release	Date	Changes
100	31. 3. 2015	New document

Related documentation

1. **APAxXX** Series of panel computers for rolling stock – Operation manual
file: apaxxx_g_en_XXX.pdf
2. Backup battery module – Datasheet
file: sp_mb247720_d_en_XXX.pdf

1. Introduction

This manual describes the procedure of backup battery replacement, cleaning of internal electronics and disassembling / assembling of **APAxXX** panel computer series.

For most procedures it is necessary to unmount the computer from vehicle, in some cases it is not necessary to disassemble the whole unit. Disassembling / assembling is described in special chapter 2. – Disassembling / assembling. For backup battery replacement and cleaning specifics follow chapters 3. – Backup battery replacement and 4. – Cleaning.

2. Disassembling / assembling

Disassembling / assembling of the unit consists of unmounting / mounting the computer from the vehicle and disassembling / assembling of the unit electronics.

2.1. Tools and material

- Tool for releasing screws in the corners of the computer's front panel (depends on vehicle project).
- Cross screwdriver PH2
- Star screwdriver TORX TX10
- Tweezers
- Weak or middle strength thread locker e.g. LOCTITE 222 (weak strength), LOCTITE 243 (middle strength)

2.2. Disassembling

- Unmounting from vehicle**
1. Disconnect all the connectors from the computer.
 2. Unmount the computer from mounting opening in the desk. Computer is fastened by 4 screws in the corners of front panel.

Disassembling of the unit electronics

For access to the backup battery and to the inner electronics of the computer it is necessary to split the front panel with LCD and back cover which contains the rest of the electronics. Disassembling has to be done on the working table with that surface which cannot cause scratches on parts of panel computer especially display area or front panel foil. See the instructions as follows:

1. Unscrew four M3 head screws in the back cover corners. Use the cross screwdriver of PH2 size.

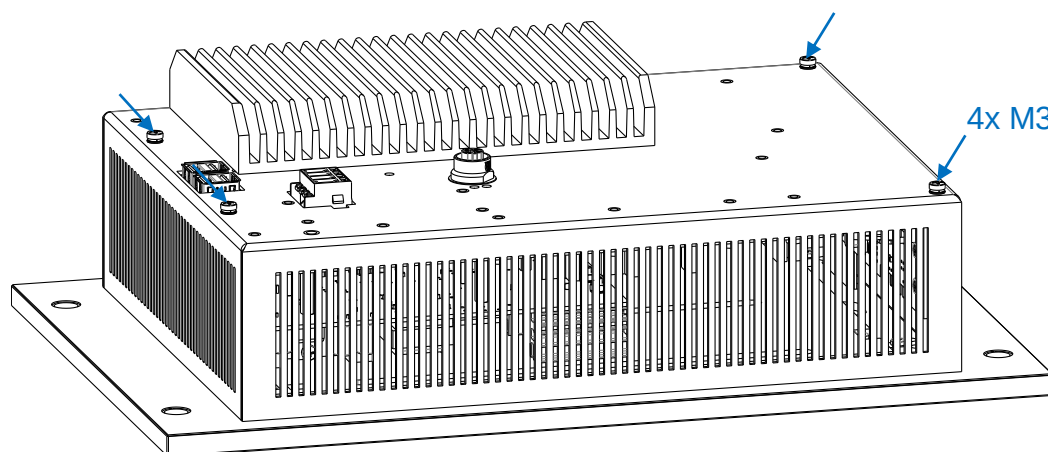


Fig. 1 - Back cover screws

2. After unscrewing of the back cover screws the unit must to lie on the back. We need to lift panel for 5 ÷ 8 cm. Now we have access to inner cabling of LCD screen. We need to VERY CAREFULLY disconnect cables from LCD screen using tweezers. Correct directions for pulling off connectors from

LCD screen are marked by red arrows. See Fig. 2. Repairing of broken connectors caused by wrong handling can be done only by manufacturer.



Fig. 2 - Wiring of LCD display

3. Carefully separate panel from the cover with electronics and disconnect remaining 26-wire cable. Connector can be removed only when safety levers on a counterpart connector are unlocked, see Fig. 4.

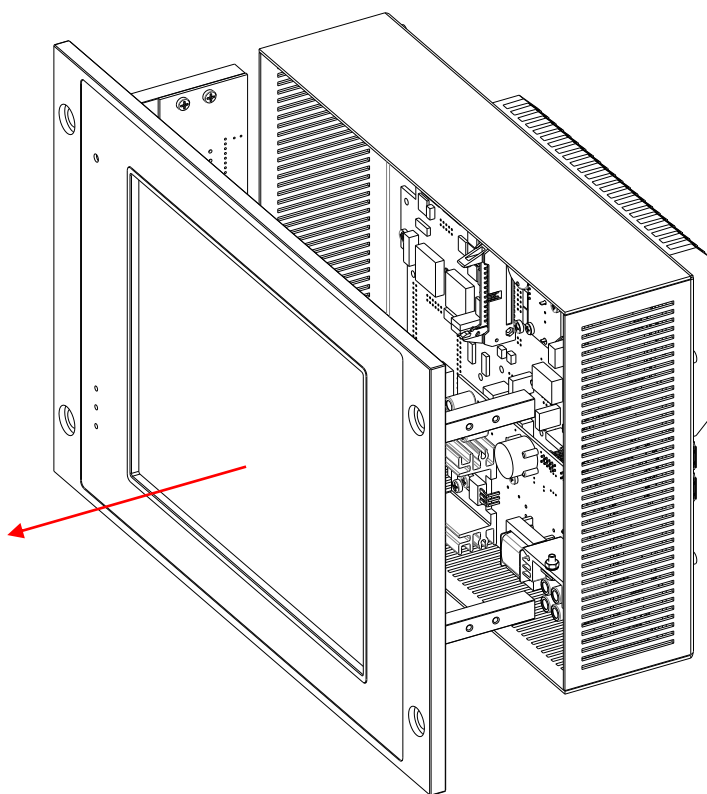


Fig. 3 - Splitting of panel and back cover

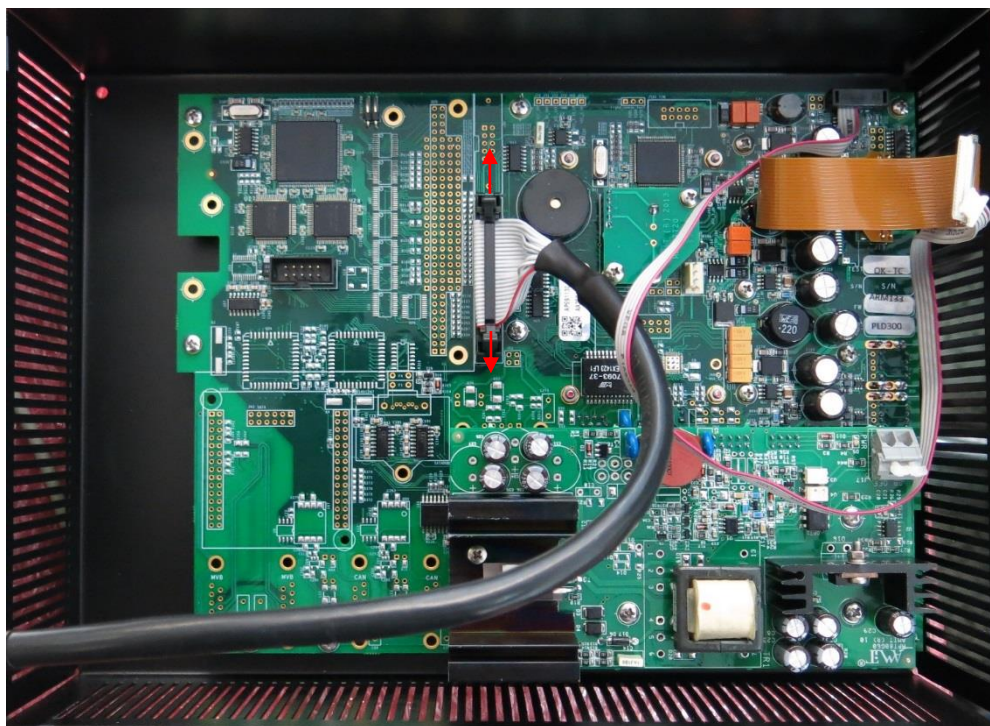


Fig. 4 - Disconnecting of remaining cables

4. Now we can continue to inner electronic cleaning or backup battery replacement.

2.3. Assembling

1. Connect 26-wire connector between panel and back cover.
2. Panel and back cover must to fit together. Be aware of situation when cables getting stuck between parts of computer. Make sure if 26-wire cable is led thru middle of cooler, see Fig. 5.

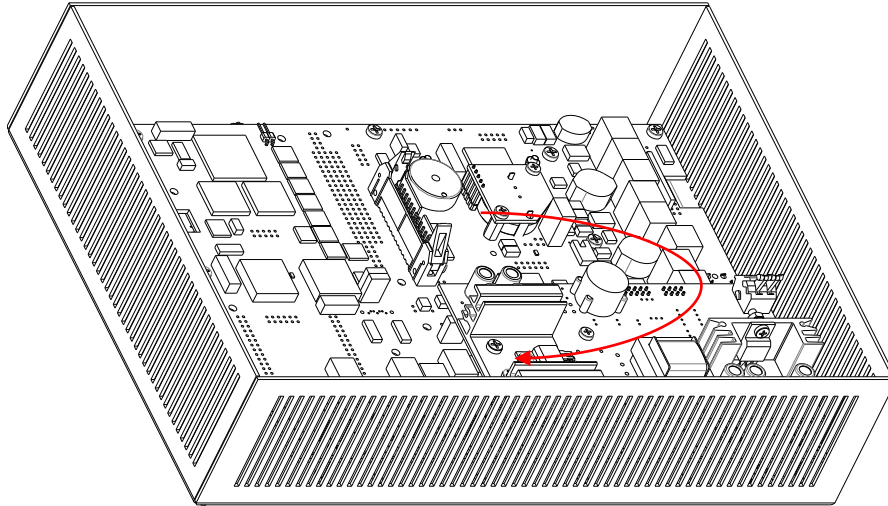


Fig. 5 - Leading of 26-wire cable

3. Before inserting panel to the back cover connect two remaining cables to the LCD screen. For pressing of connectors to the final position you can use other side of tweezers.
4. For fastening the back cover and panel use screws with split and flat washers. Right order of mounting in direction from the back cover is flat washer, split washer and screw.
5. Now the panel computer is ready for mounting back into the vehicle.

3. Backup battery replacement

Backup battery is a part of the backup battery module. For ordering information see chapter Ordering information of relevant Operation manual.

Some of units may be equipped by backup battery holder for easy replacement. Chapter 3.1. – Determining location of backup battery module can help you to determine position of backup battery module in your unit.

3.1. Determining location of backup battery module

- If is your unit equipped by backup battery holder for easy replacement as shown in Fig. 6 follow the chapter 3.3. – Procedure for replacement – holder for easy replacement.
- If isn't your unit equipped by backup battery holder for easy replacement as shown in Fig. 6 follow the chapter 3.4. – Procedure for replacement – built-in module.

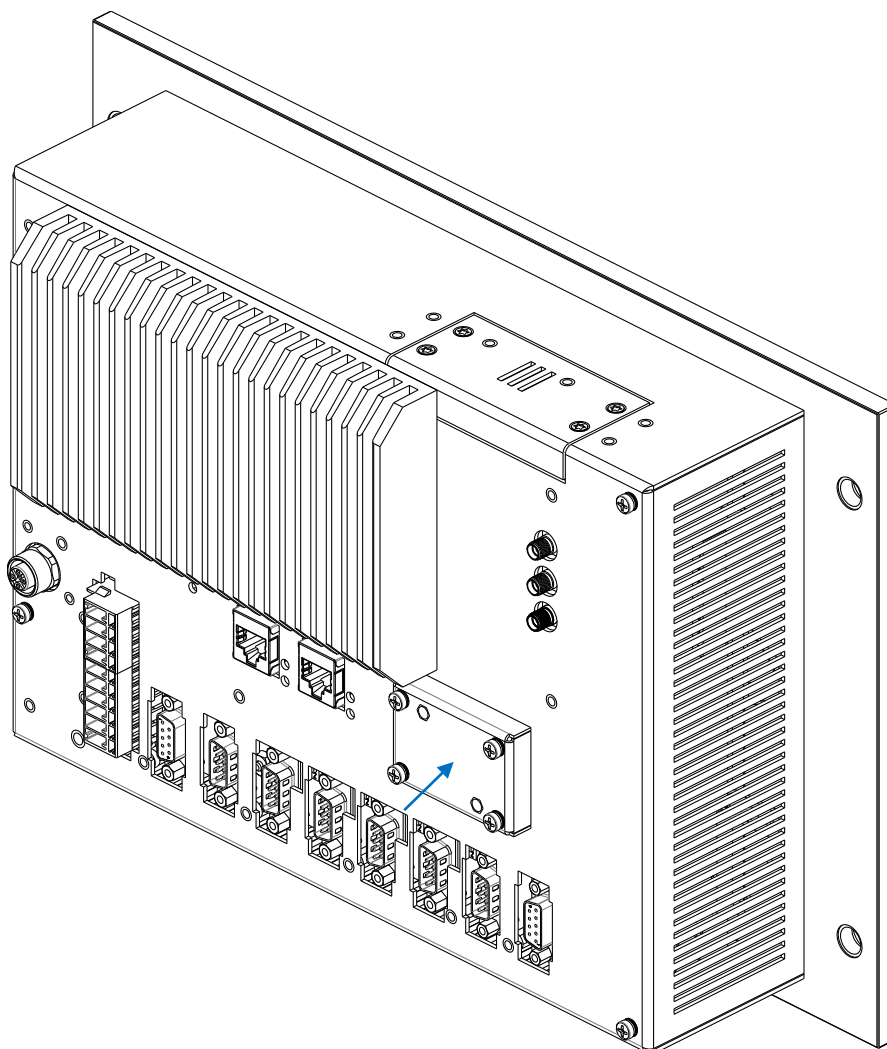


Fig. 6 - Possible location of backup battery holder on back cover

3.2. Tools and material

- Cross screwdriver PH2
- Thread locker for weak or middle strength e.g. LOCTITE 222 (weak strength), LOCTITE 243 (middle strength)
- 5 mm open end wrench

3.3. Procedure for replacement – holder for easy replacement

- Battery module demounting**
1. Unmount the computer from the vehicle. Follow instructions in chapter 2.2. – Disassembling. Disassembling of the unit isn't necessary.
 2. Unscrew four M3 headed screws which fastens backup battery holder.

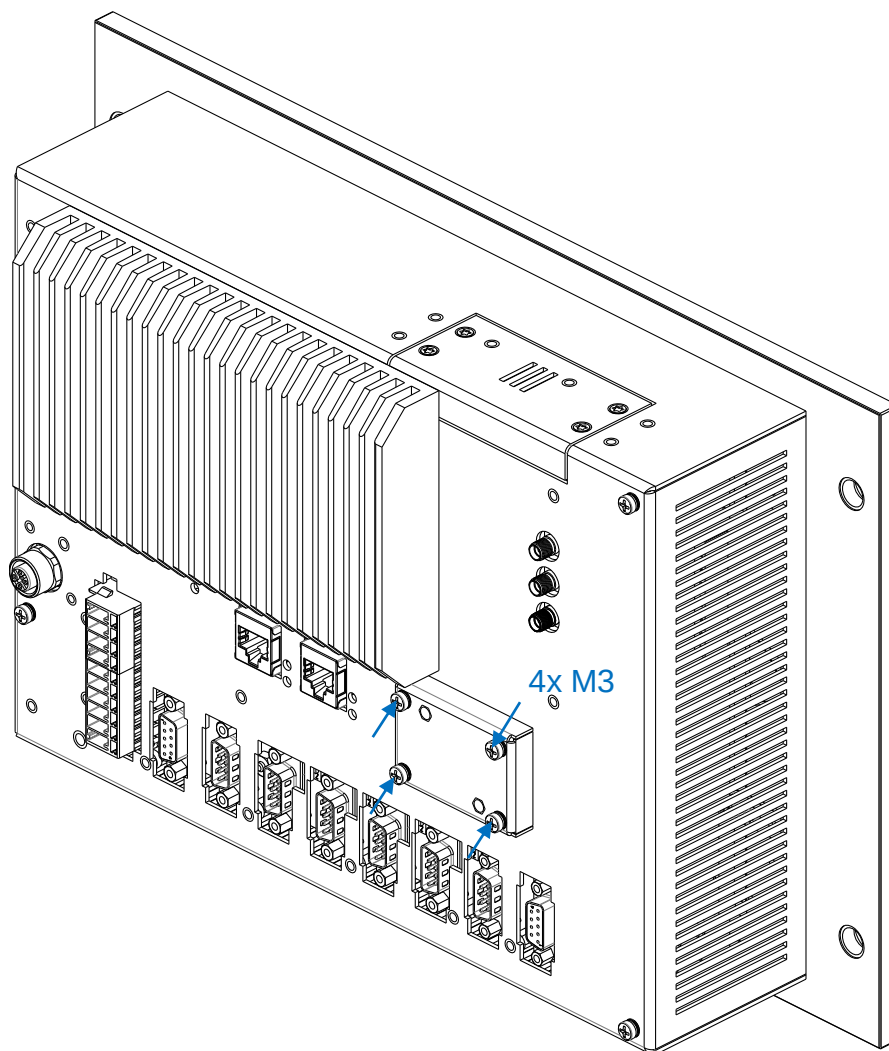


Fig. 7 - Screws which fastens backup battery holder

3. Carefully pull out backup battery holder. Right direction for pulling is marked by red arrow.

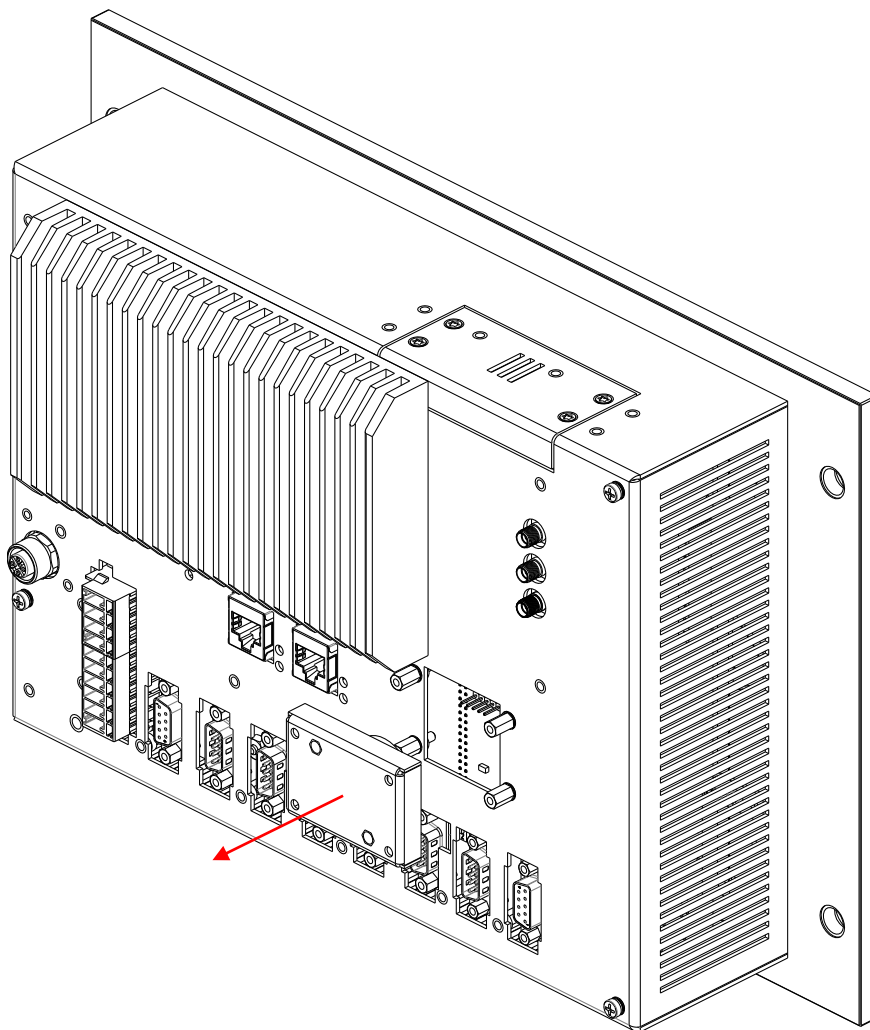


Fig. 8 - Direction for pulling of backup battery holder

**Battery
module
replacement**

1. Unscrew two M3 headed screws. Screws are secured by thread locker. Replace the backup battery module with a new one. Secure screws again by thread locker .

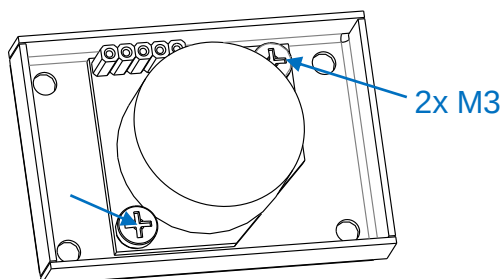


Fig. 9 - Fixing the battery module in battery module holder

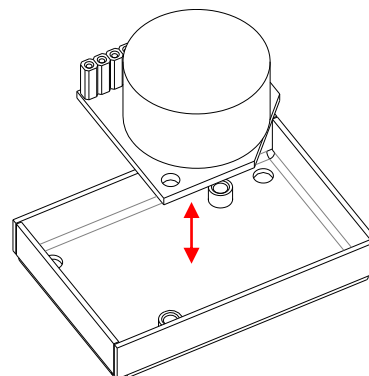


Fig. 10 - Removing the battery module from the holder

**Battery
module
mounting**

1. Attach the backup battery holder on the unit back cover. Watch out for right orientation of the holder. Male connector on back cover must fit with female connector on backup battery holder. All pins of connectors must be concentric.

Wrong handling may cause destroying of battery module !

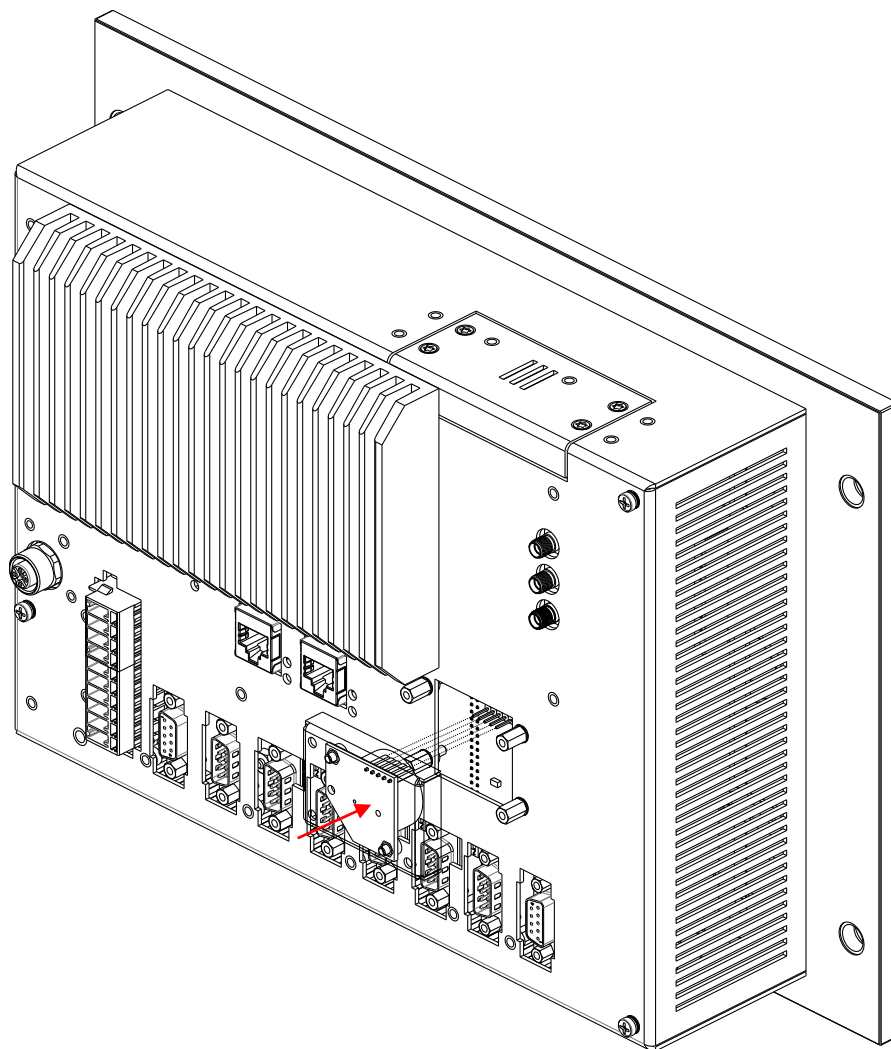


Fig. 11 - Orientation of attaching the backup battery holder

2. For backup battery holder mounting use four M3 headed screws with split and flat washers. Right order of mounting in direction from the back cover is flat washer, split washer and screw.

3.4. Procedure for replacement – built-in module

**Battery
module
demounting**

1. Unmount the computer from the vehicle. Follow instructions in chapter 2.2. – Disassembling. Backup battery module is located on motherboard close to the buzzer and 26-wire cable connector.

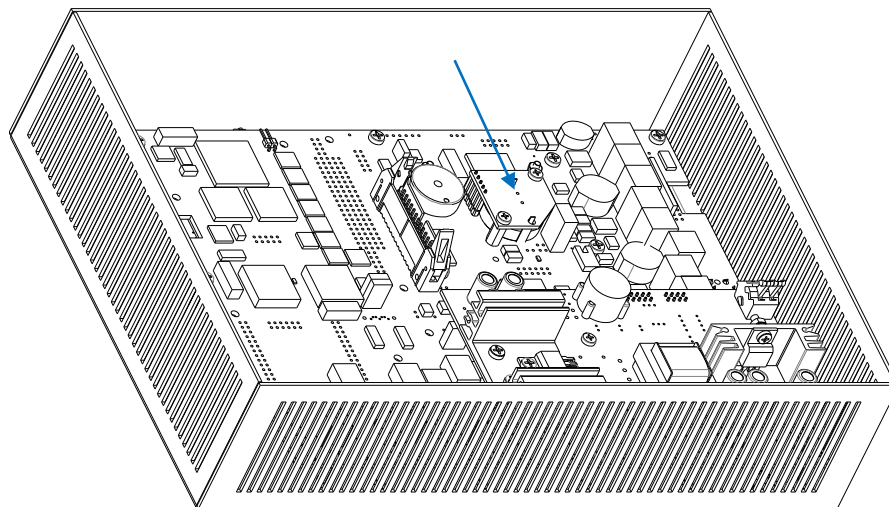


Fig. 12 - Location of built-in backup battery module

2. Unscrew two M3 headed screws. Screws are secured by thread locker. It's recommended to hold the columns using 5 mm open end wrench during screwing.

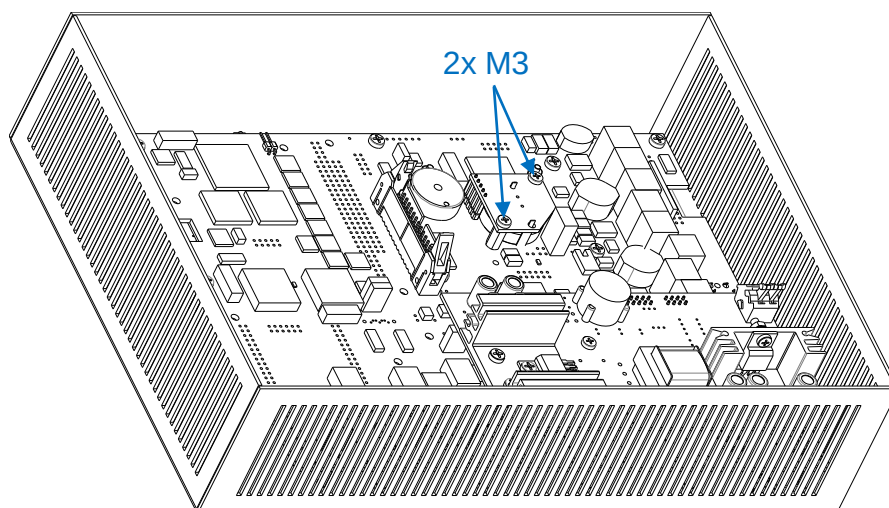


Fig. 13 - Demounting of built-in backup battery module

- Battery
module
mounting**
3. Replace the backup battery module with a new one.
 4. Screw the new module using thread locker.
 5. Assemble the computer according to the procedure described in chapter 2.3. – Assembling.

4. Cleaning

There are cleaning ways of **APAxXX** computer series as follows:

Front panel cleaning Front panel and display screen area have to be cleaned with dry or wet cloth. It's necessary to use cleaning agents which cannot cause scratches on screen area or front panel foil. Computer unmounting from vehicle is not necessary.

Electronics cleaning without disassembly Dust settles on panel computer's electronics and cooler, so thermal transmission between computer parts and ambient air is worse. Because of that dust has to be removed. Without disassembly the removal can be done by vacuum cleaner.

Electronics cleaning with disassembly Depending on the dustiness of the environment the cleaning without disassembly can be insufficient.

Disassemble the computer according to the procedure described in chapter 2.2. – Disassembling.

Cleaning has to be done by dry soft brush or vacuum cleaner.

Assemble the computer according to the procedure described in chapter 2.3. – Assembling after cleaning process.

5. Waste disposal

Battery disposal Backup battery module contains lithium battery. The battery is a dangerous waste. Therefore, it must be delivered to places specified for that purpose. Disposal of empty batteries and accumulators must not be in contrary to valid regulations.